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AUTHOR Alexander, Karl; McDill, Edward L.
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SOCIAL BACKGROUND AND SCHOOLING INFLUENCES ON THE SUBJECTIVE ORIENTATIONS OF HIGH SCHOOL SENIORS

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KARL ALEXANDER

EDWARD L. McDILL

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Introductory Statement

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through three programs to achieve its objectives. The Schools and Maturity program is studying the effects of School, family, and peer group experiences on the development of attitudes consistent with psychosocial maturity. The objectives are to formulate, assess, and research important educational goals other than traditional academic achievement. The School Organization program is currently concerned with authority-control structures, task structures, reward systems, and peer group processes in schools. The Careers program (formerly Careers and Curricula) bases its work upon a theory of career development. It has developed a self-administered vocational guidance device and a self-directed career program to promote vocational development and to foster satisfying curricular decisions for high school, college, and adult populations.

This report, prepared by the School Organization Program, focuses on the evaluation of a "school process" model in order to explore how subjective school outcomes are influenced by social background and schooling.

ABSTRACT

A multivariate "school process" model is evaluated to explore some of the ways in which social background and schooling influences combine to affect subjective school outcomes. Four areas of subjective orientation are considered: educational plans, self-conceptions of competence, intellectualism, and satisfaction with school. The analysis, based on questionnaire and testing data for a sample of high school seniors, identifies "social background" characteristics (sex, measured ability, and status origins) as important determinants of such outcomes, while school process mechanisms, including curriculum enrollment, characteristics of peer associates, and academic performance, both contribute uniquely to the explanation of subjective orientations and serve as important mediators of background influence. Quite diverse specific patterns of dependency are obtained across outcomes. Finally, two underlying dimensions of subjective orientation are found to practically exhaust the explanatory power of predictor variables vis-a-vis the four outcomes.

SOCIAL BACKGROUND AND SCHOOLING INFLUENCES ON THE SUBJECTIVE ORIENTATIONS OF HIGH SCHOOL SENIORS

Introduction

While research into the school process is multi-faceted, it has tended to focus on what might be characterized as the more cognitive and "tangible" educational outcomes. In particular, levels of academic achievement (as measured by standardized testing instruments) and levels of educational attainment (referring either to years of schooling received or level of certification acquired) have been the subject matter of an enormous body of research literature, with a number of recent inquiries particularly enhancing our understanding of the social and organizational dynamics of such attainments (Alexander and Eckland, 1974b; Hauser, 1971; Sewell, Haller, and Portes, 1969). Interest in these topics is, of course, well-founded. The development of cognitive skills is certainly one of the primary objectives, if not the primary objective, of our educational system, while the wide-ranging consequences of retention through that system for one's adult life-course, either by virtue of the certification attendant thereon or of the skills and habits acquired therein, is amply documented (Blau and Duncan, 1967; Collins, 1971; Duncan, Featherman, and Duncan, 1972).

Without detracting from the importance of the above topics, it should be clear that they hardly exhaust the wealth of interesting schooling outcomes. Indeed, were the social organization of the school itself, or the social-psychology of schooling, the primary substantive concern, such "objective" educational attainments might be quite

incidental, at least to the extent that their importance is external to the schooling process per se (i.e., by virtue of their consequences for post-schooling adult achievements).

As Jencks has observed (1972:131-134), most non-cognitive school outcomes have recieved relatively little systematic consideration, either with regard to their determinants (especially insofar as these involve school "structure and process" variables) or to their consequences beyond the immediate social context of the school. The present research addresses itself to the first of these issues for selected subjective orientations to the school, the schooling process, and oneself. In particular, four "academically-relevant" subjective outcomes will be considered: educational goal-orientations , self-conceptions of academic competence, intellectual orientation, and satisfaction with school.

The choice of these particular variables for study is admittedly not founded in any integrative "theory" of subjective school processes; nevertheless, each taps an important dimension of academic or intellectual subjective orientation. Because of their relevance to educational objectives (i.e., the inculcation of "desirable" values regarding school and schooling) and to the "quality of life" in educational institutions (as reflected in expressed satisfaction with school and the development of one's sense of competence or self-esteem), these outcomes are of interest in their own right, beyond whatever consequences they might or might not have for more tangible educational attainments.[1]

To assert, as we have above, that such variables have received "relatively little systematic consideration" may seem somewhat peculiar

in view of the volumirous research literature regarding, for example, educational goals or academic self-esteem. It is not the quantity of such research to which we refer, though, but rather its character. In the early stages of inquiry, the goal of understanding is usefully served by the discovery of correlates (ideally theoretically deduced) of the phenomenon of interest. But such understanding is impaired, or at least not particularly enhanced, if the continued search for additional correlates is not complemented by efforts at conceptual organization and integration to bring order out of what would otherwise be empirical chaos. It is in this last regard that the literature on subjective school outcomes is particularly lacking. Without attending the structure of relations among explanatory variables themselves, we necessarily remain ignorant of the complex dynamics by which subjective orientations are established and maintained, this despite our ability to perhaps enumerate a multitude of their predictors. In this report we develop and evaluate a model which does specify some of these relations in exploring the role of selected school process and background variables in the determination of the above four subjective outcomes. Before developing the details of this particular model, however, it might be of value to briefly review the research tradition which it reflects.

There has, of course, been a longstanding interest in the social processes affecting variables such as educational and occupational goals. Two recurrent themes in this literature involve the importance of social origins and of interpersonal influences, particularly those of parents and peers, for such goals. While the knowledge that status characteristics

of one's family of origin, parental encouragement, and selected peer characteristics (usually their own goal levels) are all related to one's goal orientations is certainly valuable, consideration of the interrelations among such sources of influence contributes far more to our understanding of how they function. Analyses of this sort have suggested, for example, that parents and peers both constitute independent sources of interpersonal influence and, moreover, that they more frequently complement rather than contradict one another in this regard. Furthermore, it appears that social origins are of consequence in the goal-setting process largely by virtue of differential parental support and encouragement across status levels. Thus, with measures of interpersonal influence controlled, status differences in goal levels are appreciably reduced (Haller and Butterworth, 1960; Kandel and Lesser, 1969; Simpson, 1962).

The research strategy suggested by this relatively simple three variable example has subsequently been formalized and extended to rather complex analytical models. Such models posit an explicit causal structure among predictors and outcomes and detail the mechanisms, both direct and indirect, by which the former affect the latter (under the constraints imposed by the adopted causal framework). In the educational literature, this analytical strategy is best exemplified by the innovative research of Sewell and his colleagues (Haller and Portes, 1973; Sewell, 1971; Sewell, Haller, and Portes, 1969), whose paradigm has had a substantial impact on subsequent work in this area (Alexander and Eckland, 1973; Duncan, Featherman, and Duncan, 1972).

Sewell's primary interest lay in explicating the dynamics of educational and occupational attainments by exploring the interplay between background and school process variables, the latter including measures of academic performance, interpersonal influence (by parents, teachers, and peers), and goal-orientations. His "social-psychological" model of educational attainment revealed much of the consequence of "background" variables (the status characteristics of one's family of origin and measured academic ability) for such attainment to be mediated through more proximate interpersonal and subjective mechanisms.

Sewell's choice of educational plans as an intervening variable in his model was dictated more by his interest in explaining tangible educational attainments than by an immediate concern with subjective school outcomes per se. Similarly, although subsequent inquiries have considered additional dimensions of subjective orientation, these, and the analytic models they employed, have also been principally oriented toward more "tangible" school outcomes (Alexander and Eckland, 1973). Finally, a few studies have adopted a modeling framework in primary consideration of subjective school outcomes, but, although extremely informative, they have generally been rather narrow in scope, usually being restricted to educational goals and/or some index of self esteem (Gordon, 1972; Williams, 1972).

Our substantive model is presented schmatically in Figure 1. The four subjective school outcomes, educational plans, intellectual orientation, satisfaction with school, and sense of academic competence, constitute the "ultimate" dependent variables in the model. Employing the diagramatic conventions of path analysis, the double-headed curved

arrows directly linking subjective outcomes with one another indicate that no assumptions regarding causal priority in the relationships among these variables are being made. Hence, their residual correlation, in comparison with their corresponding zero-order relationships, will indicate the adequacy of our model in accounting for the covariance among, or, put somewhat differently, the common content of, subjective school outcomes.

Figure 1 About Here

The remainder of the model consists of exogenous background variables and intervening school process mechanisms. The background variables are of the sort commonly considered in research on the schooling or attainment process, consisting of measures of the status characteristics and composition of the student's family of origin, sex, and a measure of academic ability, in this case an abstract reasoning test first developed for the Project Talent studies.

Of course, the relative importance of status ascription and selection on the basis of ability in the schooling process is a matter of considerable importance, not only because of its implications for "equality of opportunity" in the functioning of our educational institutions, but for one's adult life chances as well. For levels of educational attainment itself, the research literature suggests substantial elements of both status ascription and selection by ability, with the latter being somewhat more pronounced. No such general conclusion can be offered for their relative (or absolute, for that matter) importance with regard to other school outcomes, however, since this appears to be quite

variable (Alexander and Eckland, 1973; Alexander and Eckland, In Press; McDill and Rigsby, 1973; Sewell, Haller, and Portes, 1969).

The internal structure of our model consists of selected "school process" variables, including curriculum enrollment, measures of peer characteristics, and two indicators of academic achievement. Curriculum enrollment, which will be dichotomized in our analysis to distinguish between college preparatory and "other" curricula, has frequently been identified as an important "sorting and selecting" mechanism in the social organization of schools (Heyns, 1974; Parsons, 1959; Ramsøy, 1965). Indeed, recent inquiries have detailed rather extensive consequences for such streaming decisions, well beyond those which could be attributed to the differential characteristics of students who are aggregated in various curricula. Social origins and measured academic ability, for example, account for only about one-fourth of the variance in curriculum placement (Alexander and Eckland, In Press; Hauser, Sewell, and Alwin, 1974), establishing an upper bound on the extent to which curriculum effects can represent the "administrative" mediation of such background influences. Although the structural and/or interpersonal loci of curriculum effects are not yet adequately understood, they certainly merit further attention.

Bypassing for the moment the justification for this particular causal arrangement, three measures of peer characteristics appear next in the model. These distinguish among the status characteristics of peers, their levels of academic ability, and their educational plans. While it is not uncommon to find such measures used interchangeably in the literature on peer and interpersonal influences, recent critical

inquiry suggests that such practice may seriously distort our conclusions regarding these processes and will certainly impair comparability across studies (Rigsby and McDill, 1972). Our analytical strategy will enable us to estimate the unique importance of each of these peer characteristics for academic performance and subjective school outcomes, as well as their responsiveness to the variables appearing earlier in the model. Of particular interest will be the extent to which peer background characteristics directly affect schooling outcomes once peer goal levels are taken into account. In other words, does some educational benefit (or liability) accrue from association with students of particular social origin or ability levels beyond that which derives from whatever differences in interest accompany differences in background? Previous research is hardly at all informative with regard to such matters, except perhaps in the sense of reminding us that peer influence processes are likely quite complex (Duncan, Haller, and Portes, 1968; Haller and Butterworth, 1960).

The last intervening variables in our model are two measures of academic performance, one involving absolute levels of achievement (in the field of mathematics) and the other achievement relative to peers across subjects (as indexed by class rank). While the distinction between relative and absolute performance is rarely drawn in the literature,[2] there is good reason to believe that they may be both somewhat differently responsive to social influences and, of particular interest here, differentially important with regard to subjective school outcomes. Consider, for example, Wofle's observation (1954:151) that:

> When a high school student tries to size up his prospects for successful college work, school grades are an obvious guide for him to use...an adolescent characteristically goes through a stage of appraising his potential success in a field...by thinking in terms of the caliber of work he has done in relevant school courses. He is usually vague about his score on a standardized intelligence test. But he does know his class standing, and it is likely to be the most important single variable in helping him to decide about his chances of doing successful college work.

Substituting "academic achievement" for "intelligence" in the above quotation clearly suggests the importance of distinguishing among various forms of academic performance and achievement. In general, the school process literature has been remiss in failing to attend to such distinctions and their social consequences.[3]

Since this review of the details of our model has approximated a dissection, it should be emphasized that the unique value of this analytic strategy lies in the structure as a whole, which both constrains and informs the analysis. By accepting the limits imposed by the causal ordering diagrammed in Figure 1, we are able to derive unique estimates of the coefficients attaching to each linkage in the model and, through the appropriate manipulations of these coefficients, trace through the complex pattern of direct and indirect influence which they imply. The result will be a rather detailed, albeit necessarily tentative, portrayal of the role of selected background and school process variables in the development of subjective orientations toward school and schooling.

In concluding this Introduction, we should perhaps briefly address an issue alluded to above. We mentioned that the causal structure presented in Figure 1 both "informs and constrains." Our comments thus far

have elaborated upon the informative value accruing from our a priori commitment to such a causal scheme. Accepting such constraints is not without its risks, however. To the extent that the causal assumptions explicit and implicit in the model (See Heise, 1969, for a discussion of the latter) violate "reality," the coefficients generated in our analysis will be biased. Typically the ordering of variables in such models is dictated by either their temporal occurrence or some "strong" theoretical underpinning (in principle the underpinning should be strong; in practice, however, it is often quite weak). Clearly, neither circumstance holds with regard to our model, although a weak argument could be developed in terms of temporal reference despite the fact that we will be employing cross-sectional data.[4] At any rate, time-series data would likely reveal most of the asymmetrical causal linkages in our model to involve some degree of mutual influence over time (Alexander and Eckland, In Press; Duncan, Haller, and Portes, 1968; McDill and Coleman, 1963). The parameters of such mutual influence, however, could not adequately be estimated with the data available to us.

The justification for the specification of our model, then, must be largely heuristic. The patterns of influence portrayed are "reasonable," in the sense that each has been suggested as of some consequence in previous inquiries, and some such restrictive assumptions must be accepted for analysis to proceed. Any such model must necessarily be considered provisional, with no particular claims for authoritativeness or definitiveness. Clearly, our parameter estimates will not precisely reflect the complexity of "real world" causal dynamics regarding these matters. Nevertheless, should our results seem interesting and suggestive, they

hopefully will stimulate further analysis with perhaps more "realistic" specifications. Such incremental model building is, of course, the way knowledge cumulates, and it is for this reason that the analysis of such models requires, not apology, but caution.

METHOD

Sample

Our data are part of a survey conducted in twenty, public, co-educational high schools in 1964 and 1965 (McDill, Meyers, and Rigsby 1967; McDill, Rigsby, and Meyers, 1969; Rigsby and McDill, 1972; McDill and Rigsby, 1973). The schools were selected in a purposive manner in an attempt to maximize variation on educational and social climates, demographic and social characteristics, region of the country, and educational outcomes such as college plans and educational and occupational aspirations. Detailed information on the selection of the sample and its characteristics is presented in McDill and Rigsby (1973).

Several types of data were collected in the survey: self-administered questionnaires from 20,345 students, 1,029 teachers, and the principals of each school; relevant information from student permanent records such as grade-point averages in English, academic rank (available for seniors only), and absences; and scores obtained on two standardized, academic tests, one measuring aptitude for abstract reasoning (AR), consisting of 15 items, and the second, 24 items in length, measuring achievement in mathematics (MATH).[5]

The sample on which we report here consists of all seniors for whom relevant data were available in the eighteen schools which had a twelfth grade.[6]

Variable Measures

1. Social Background Variables

   A. Father's Education: Seven precoded response categories, ranging

from "some grade school" to "attended graduate school or professional school after college," were provided for a single item in the student questionnaire.

B. Mother's Education: This measure is identical to that for father's education.

C. Number of Books in the Home: This indicator of family SES[7] is based on the following responses to an item which asked the student to estimate the number of books in his home

1. none or few (0-25)
2. one bookcase full (26-100)
3. two bookcases full (101-250)
4. three or four bookcases full (251-500)
5. a room full--a library (501 or more).

D. Father's Occupational Status: An item in the student questionnaire relating to father's current occupation contained 17 response categories. These were collapsed to the following eight occupational prestige categories, which correspond to the conventional census classification of occupational status developed by Edwards (1943): unskilled, semi-skilled, skilled, clerical or sales, proprietor, managers or officials, technical, and professional.

E. Number of siblings: The measure of this variable is based on responses, ranging from 0 to 9, to the following item in the student questionnaire: "How many brothers and sisters do you have?"

F. Sex is employed in the analysis as a dummy variable, with boys coded 0 and girls 1.

2. Academic Variables

A. Academic Aptitude:aptitude was measured with a fifteen-item, multiple-choice test administered by the guidance departments of each school. The Project Talent researchers who constructed the test designed it to measure one type of reasoning ability--the ability to determine inductively the logical relationships among patterns of diagrams (Dailey and Shaycoft, 1961, pp. 40-42).[8] The reliability estimates we obtained for the senior boys and girls, using the KR-20, are .634 and .654, respectively. These coefficients compare favorably with those obtained by the Project Talent staff on their nationally representative sample of high school students (Flanagan, et al., 1964).

B. Mathematics Achievement: a twenty-four item, multiple choice test, designed by the Project Talent researchers to measure achievement in mathematics through the ninth grade level, serves as our measure of "absolute" performance. The reliability coefficients for senior males and females are .890 and .866, respectively. These coefficients are modestly higher than those for the national sample of students in the Project Talent research.

C. Academic Rank in Class: This measure of "relative" academic performance, obtained from students' permanent records,

is expressed in percentile form.

D. Curriculum: Program of study in which the student was enrolled was obtained from a single item in the student questionnaire. Responses were dichotomized into, "college preparatory" (coded 1) and "other" types of programs (coded 0).

3. Social Psychological Influences

Our model includes three different types of peer group influences on the educational outcome variables. These measures of "proximate" peer influences are likely to be more valid than the surrogate measures typically employed in survey research in that each is based on sociometric data obtained from friends named by the respondent rather than on respondents' reports of peers' characteristics. Each student was asked to name the students of the same sex in school with whom he or she associated most often. A maximum of four friends was coded for each respondent, and relevant information on these peers was extracted from their questionnaires to construct indicators of the interpersonal influences of these significant others.

A. Friends' AR: This indicator of peer group influences consists of the mean ($\bar{X}$) score of the friends on the abstract reasoning test. Scores could range from 00.000 to 15.000.

B. Friends' SES: This measure consists of the percentage of friends whose fathers had at least some college education. Scores could vary from 00.000% to 100.00%.

C. Friends' Educational Expectations: This measure consists of the percentage of friends (ranging from 00.000% to 100.00%)

who indicated they definitely intended to enroll in college "as a full-time student right after high school."

3. Subjective Orientations to the School:

Each of the four measures of non-cognitive school outcomes consists of a scale constructed by combining responses to items in the student questionnaire.

A. Educational Goal Orientations: This index of educational plans is based on responses to the following three items.

1. Are you planning to finish high school?
   1. Yes
   2. No
   3. Undecided

2. Are you planning to attend college?
   1. No, never
   2. Yes, but not right after high school
   3. Yes, as a full-time student right after high school
   4. Yes, as a part-time student right after high school
   5. Undecided

3. Check the highest level of education you expect to complete.[9]
   1. Plan to attend a two-year college
   2. Plan to get a bachelor's degree
   3. Plan to do one year of graduate study (Master's Degree)
   4. Plan to obtain a professional degree
   5. Plan to obtain a Doctoral Degree
   6. I have not made a decision about my plans.

Scores on this index, obtained by combining responses to the three items, vary from 1 (no definite commitment to finishing high school) to 8 (plans to obtain the Ph.D.).

B. Satisfaction with School: Two items were employed in constructing this measure:

1. The total number of clubs and extra-curricular activities in which the student participated: 0, 1, 2, 3, and 4 or more.

2. My time in this school has been...
   1. unhappy
   2. somewhat dull
   3. fairly pleasant
   4. interesting and filled with work
   5. filled with fun and excitement (responses "4" and "5" combined)

Scores on this index, obtained by summing responses to the two items, ranged from 1 to 8. The scale, unfortunately, confounds behavioral and attitudinal measures; nevertheless, it seems reasonable to assume at least a rough correspondance between extent of involvement in school activities and satisfaction with school.

C. Self-Conceptions of Academic Competence: The measure of the student's academic image was constructed from three items, the first two tapping self-evaluation and the third the respondent's perceptions of teachers' evaluation of his/her ability.

1. I am often not able to keep up with the rest.
   1. Agree
   2. Disagree

2. I am not doing so well at school
   1. Agree
   2. Disagree

3. Of the teachers at this school whom you know, how do you think most of them would rate <u>you</u> as a student?
   1. Poor
   2. Average
   3. Bright

Unweighted scale scores for this variable were obtained by summing responses to the items. Scores ranged from 3 ("agree" to items 1 and 2 and "poor" to the third item) to 7 ("disagree" to the first

two items and "bright" to item 3).

D. Intellectual Orientations: The measure of this attribute is a slightly modified version of the "intellectual-achievement" scale recently employed by McDill and Rigsby (1973, p. 41). The earlier version consisted of a summated binary rating scale of six items, each tapping a different component of students' academic commitment (i.e., interests, values, and motivations). The six-item scale had an acceptable reliability coefficient of .59 (KR-20) and was shown to have substantial concurrent validity (McDill and Rigsby, 1973 pp. 56-62). The measure we employ in the present analysis is composed of the original six items plus an item measuring the average amount of time the student devoted to homework:

1. How the respondent would use a free hour in school:
   1. course
   2. athletics
   3. club or activities
   4. study hall for studying
   5. study hall not for studying

   (Responses "1" and "4" combined).

2. Rank assigned to "learning as much as possible in school" among a list of four alternatives (rank 4 = highest in importance to the respondent).

3. How respondent would like to be remembered in school:
   1. brilliant student
   2. athletic star (boys) or leader in activities (girls)
   3. most popular

   (Responses "2" and "3" combined)

4. How important to respondent to receive good grades:

   1. extremely important
   2. important
   3. not important

5. How satisfying to respondent to work hard on studies:

   1. extremely important
   2. important
   3. not important

6. How much respondent admires students who are bright:

   1. very much
   2. a little
   3. not at all

7. The average amount of time the respondent spends on homework outside school:

   1. none or almost none
   2. less than 1/2 hour a day
   3. about 1/2 hour a day
   4. about 1 1/2 hours a day
   5. about 2 hours a day
   6. 3 or more hours a day

The response categories for the items were collapsed and recoded in a manner which produced a scale with a range of possible scores from 8 to 24. The reliability coefficient for the resulting scale is .650 , certainly an acceptable level for an instrument with such a limited number of items.

Analysis

Multiple regression and path analysis will be our basic analytic techniques. The coefficients to be reported may be interpreted as net, standardized effects. Indirect patterns of influence can be computed through the standard "tracing" rules of path analysis. The techniques and assumptions of this procedure are detailed elsewhere (Duncan, 1966; Heise, 1969; Land, 1969) and need not be recapitulated here.

RESULTS

Due to considerations of space, the basic data for our analysis, including means, standard deviations, and interitem correlations, will not be presented. Most of our discussion will revolve around the parameter estimates for the reduced form and full structural versions of the model in Figure 1. These are reported in Tables 1 and 2, respectively.

It will be noted that sex is included in these tables as an exogenous variable. Thus, we will be able to assess how adolescent boys and girls differ, net of any effects of ability and status origins, on the various school process and outcome variables, and, in the structural version, examine some of the mechanisms by which these differences are maintained. We had originally intended to present our results separately by sex and explicitly consider both sex main effects and interactions in the school process model; however, the latter were found, in general, to be negligible. In only one instance, for example, did the addition of multiplicative terms involving sex and every other regressor in a particular equation result in as much as a one percent increase in explanatory power over that of the additive effects equation. In view of the large number of interactions considered and their overall inconsequence, we will not pursue this matter further; however, we have appended tables reporting the "within-sex" standardized coefficients for the benefit of the interested reader. It might be mentioned that, in contrast to our results, other inquiries have obtained some notable sex interactions, particularly involving sex differences in the importance of social origins and measured ability in the educational attainment

process (Alexander and Eckland, 1974b; Sewell and Shah, 1967).

We will consider first the results for the reduced form equations, in which each school process variable and subjective outcome is expressed as a function of background influences only (status origins, ability, and sex). It might be noted that our sample size of almost 4000 essentially obviates an interest in tests of statistical significance. Any coefficient sufficiently large to merit note will certainly be "significant" at conventional alpha levels, as will many whose substantive implications would be considered trivial by any reasonable standard. Consequently, in order to restrict the discussion to influences of some substantive interest, coefficients of less than .100 will be disregarded.

Turning now to Table 1 itself, we begin by clarifying the meaning of the coefficients appearing in parentheses about midway down the table. These have been labeled "SES" effects, in that they summarize the gross effects of the four separate status background variables, treated as a "set" (mother's and father's education, father's occupation, and number of books in the household). Computed through a procedure outlined by Heise (1972), which essentially sums the separate effects and adjusts that total for the covariance among items, these coefficients will facilitate the comparison of "status origin" influences with those of other variables in the analysis. It should be emphasized, though, that the "SES" and separate status coefficients are merely alternative representations of the results from the original regression analysis, and that the former are employed here for their hueristic value only.[10]

Table 1 About Here

The coefficients of determination in Table 1 indicate that the overall explanatory power of these background variables is quite varied across outcomes, ranging from a high of .355 for mathematics achievement to a low of .077 for intellectualism. The subjective school outcomes are themselves similarly varied in this regard, exhibiting both the smallest (intellectualism) and second largest (educational plans) coefficients of determination for the entire model.

In addition to their differences in overall responsiveness to background influences, the subjective outcomes also evidence quite diverse specific patterns of dependency. Consider first the results for educational plans, the subjective outcome most responsive to background influences. In this instance each of the background variables has a notable impact, with that for SES clearly exceeding the others. Indeed, each of the four separate status indicators makes a significant contribution to this "SES" effect. Measured academic ability is next in importance with regard to educational goals, followed closely by a substantial negative coefficient for sex. This last result implies that women tend to express lower levels of educational plans, even in comparison with men of comparable ability and status origins. Finally, there is a modest depressant effect for family size, which is evident to a greater or lesser degree for each of the school process variables. Thus, educational plans are found to be responsive to a range of influences, with that of status background predominating.

In contrast to its importance for such plans, social origins is of secondary consequence for both satisfaction with school and self-conceptions of academic competence. In the former case, sex has the largest effect,

with women expressing higher levels of satisfaction, followed in importance by academic ability. For self-conceptions, on the other hand, measured ability is of primary importance, exceeding status origins by a modest margin.

Status background and sex have a roughly comparable impact on intellectualism, the last of our subjective outcomes, while the coefficients for number of sibs and measured ability fail to reach our standard for imputing substantive importance. Pursuing these results a bit further, the sex coefficient implies that women score higher on the index of intellectual orientation (again, with ability and status background controlled), while the number of books variable clearly accounts for most of the SES effect in this instance.[11] As an aside, the quite different effects of status indicators across outcomes evidenced in Table 1 should underscore the merit of recent suggestions to avoid the premature aggregation of indicators when such aggregation would mask important differences among the separate items (Hauser, 1972; Hodge, 1970).

Finally, we note with interest the apparent unimportance of academic ability for intellectualism. Upon first consideration this result would seem somewhat peculiar, but of course there is no necessary correspondence between interests and competencies. Indeed, explicit quantitative assessment of this sort has exploded many such myths (Duncan, 1968; Jencks, 1972). It is probably fair to conclude that such inquiries have commonly revealed social processes to be both more fluid and complex than popularly thought.

One final observation regarding the pattern of sex coefficients across subjective outcomes is in order before turning to the "school

process" variables in the model. Despite their stronger intellectual orientation and greater satisfaction with school, women still express lower educational plans than equally able males. These results are similar in implication to those presented elsewhere (Alexander and Eckland, 1974b) which document such sex discrepancies in actual levels of educational attainment. Thus, despite their greater orientation to school and academic affairs, women still suffer some, as yet unexplained, liabilities in the educational attainment process.

While the data discussed to this point do indeed suggest wide-ranging and divergent background influences upon subjective school outcomes, our assessment of these results is necessarily tempered by the modest overall explanatory power of these variables. Consequently, in consideration of the full structural model we will be particularly attentive to both the mediation of background effects through school process mechanisms and the extent to which these contribute uniquely to the explanation of subjective outcomes.

Considering next the two measures of academic performance, standardized achievement scores are found to be considerably more responsive to background influences than is class rank, with respective coefficients of determination of .355 and .135. Most of this difference is attributable to the differential efficacy of measured ability and status origins with regard to these performance measures. Although measured ability has the largest direct effect in each instance, its coefficient is about a third again as large for absolute achievement as for class rank (at .428 and .287 respectively). Similarly, the SES effect on achievement is more than twice its impact on rank, with respective coefficients of .245 and .106.

Regardless of whether these "status" effects reflect the importance of resources, socialization, or motivation (or testing "biases", for that matter), it is clear that relative and absolute performance differ in their responsiveness to such background factors. Of course, the variable "class rank" confounds together competence and standards of evaluation, such that these results provide some insight into the criteria by which grades are disbursed. Clearly factors other than those considered here must be heavily implicated in both the performance and evaluation of students. Moreover, these results once again provide little evidence of appreciable status bias in the allocation of grades (Alexander and Eckland, In Press; Hauser, 1969; Hauser, Sewell, and Alwin, 1974).

Finally, the sex differences in academic performance present an interesting pattern. Both absolute and relative performance are found to be sex-related, but in opposite directions: girls tend to have somewhat higher class standing, despite their lower levels of achievement. Such results perhaps suggest the operation of some unmeasured, sex-related motivational influences.[12]

The three measures of peer characteristics, which appear next in the model, may be considered in conjunction. By far, the factor found to exert the strongest influence on peer sorting is one's status characteristics, with the own status-peer status linkage being particularly pronounced at .416. While aptitude appears to have some relevance to peer group formation, at least insofar as peer ability levels and educational goals are concerned, even in these instances the ability coefficients are secondary to those for status origin. Thus, in terms of the "sorting and selecting" criteria considered here, we find a strong, indeed

predominant tendency toward status homophily in peer associations (note that we have not considered the tendency for same-sex sorting, and that our measures of peer characteristics are restricted to same-sex friends).

The last school process variable in the model is curriculum enrollment. Approximately one-fifth of the variance in curriculum streaming is accounted for by the background variables under consideration, with the composite SES effect being of greatest consequence. Although the ability coefficient is only modestly smaller than that of SES (.231 vs. .279), it might nevertheless be of concern to those committed to universal achievement standards that status origins are so heavily implicated in educational tracking, regardless of whether that implication be by virtue of differential parental or student motivation, or of institutional administrative mechanisms. These results too are consistent with those reported elsewhere (Alexander and Eckland, In Press). Interestingly, then, while ability is identified as the strongest measured determinant of grades, curriculum tracking appears to involve a considerable element of "status ascription." Finally, the likelihood of enrollment in a college preparatory curriculum also decreases modestly with increasing family size.

Despite the detail of our discussion to this point, our consideration of "gross" background influences is actually only an extended introduction to our major substantive concern, evaluation of the structural model presented earlier. In it, the background effects just reviewed are decomposed into the patterns of direct and indirect influence portrayed in Figure 1 and the unique contributions of school process variables to subjective outcomes are assessed. The parameter estimates for this

model are presented in Table 2. It will be recalled that we have made no assumptions regarding causal priorities in the relationships among subjective outcomes or between the two measures of academic performance. Note also that the direct and indirect effects for exogenous variables in Table 2 will sum to the "gross" effects for these factors presented in Table 1.

Table 2 about here

A first point of interest in Table 2 is the substantial increase in explanatory power attending the introduction of school process variables to the analysis. The coefficients of determination for the subjective outcomes, for example, now range from a low of .17 for intellectual orientation to .50 for educational plans. Clearly, then, the school process mechanisms affect subjective outcomes well beyond whatever effect they might have as mediators of background influence. Moreover, comparison of the parameters of Table 2 with those of Table 1 suggest that they do indeed function, at least in part, as mechanisms of such mediation. Consider, for example, the direct background effects upon educational plans in Table 2. Each of these, with the exception of the sex coefficient, is substantially less than its corresponding value in Table 1 (the sex coefficient is only slightly lower, dropping from -.180 to -.137). Indeed, the SES coefficient is less than half its reduced form value, while the direct ability effect in the structural model is zero. Since the sum of direct and indirect effects in Table 2 must equal the coefficients of Table 1, these results imply substantial mediation of background influences through the intervening school process variables.

Inspection of the last four columns of Table 2 reveals this to be the case for each of the subjective outcomes.

Our consideration of these patterns of direct and indirect influence upon subjective outcomes can be best accomplished by first attending to the role of the school process mechanisms themselves in the model.

The influences on curriculum enrollment are the same as those in the reduced form model and need not be discussed again. Curriculum itself, however, is now included in the remaining regression equations, including those for friends' ability and SES, and its effects in both instances are worthy of note. They imply that participation in a college preparatory program modestly enhances the probability of acquiring high status and/or high ability friends.

Only a portion of these tracking effects is attributable to the fact that high status and high ability respondents are themselves differentially sorted among curricula (being overrepresented in academic tracts), and that these youth would be expected to acquire such acquaintances anyway. The extent to which these tracking "influences" can serve as surrogates for background effects may be estimated in the model as the indirect effects of respondent ability and status origins on friends' ability and SES <u>through</u> curriculum enrollment. The mediated ability effect on friends' ability would be .036 (i.e., .231 x .148), while that for own SES on friends' SES would be approximately[13] .034 (i.e., .279 x .121).[14] The remaining "unique" curriculum effects (i.e., direct curriculum coefficients less indirect effects) likely reflect the <u>overall</u> selectivity of tracts by ability and status and the importance of these administratively defined units as interaction "contexts." Of course, individual status characteristics are still identified as the principal immediate basis of peer selection

even when curriculum participation is taken into account.

A somewhat more complex pattern of influences is portrayed for peer educational goals, in that friends' own status and ability levels are now included in this regression equation. Not surprisingly, these peer background factors are of some consequence in affecting peer plans, just as the corresponding respondent characteristics influence their own goals. Thus, in part, our respondents acquire friends with particular goal levels by virtue of acquaintance based on either ability or status background. The data also suggest, however, a modest direct effect of respondent's status origins on the likelihood of acquiring high goal-oriented friends, as well as an appreciable effect of enrollment in a college-preparatory curriculum. Indeed, this last effect is the largest in the model, implying, again, the considerable importance of curriculum tracks for networks of association. It should be emphasized that most of this tracking effect is independent of the aforementioned acquisition of friends with high or low goal levels by virtue of association based on either their's or the respondent's ability or status background.

Finally, the direct effect of respondent ability for friends' goal-orientations is negligible. Thus, the modest ability effect noted in Table 1 is largely mediated through intervening mechanisms in the structural model, most notably through curriculum enrollment. It appears, then, that high goal-oriented friends are acquired in part through association based on friends' ability or status characteristics, in part through interaction in environments where such youth are disproportionate, and hence available for interaction, and in part because high status youth tend to acquire such friends even independently of these other mechanisms.

The structural model also suggests some interesting influences upon academic performance, both absolute and relative. With regard to the former, four "significant" direct effects are obtained, those of sex, ability, curriculum enrollment, and friends' educational plans. The sex effect is essentially unchanged from its reduced form value implying that, even net of the remaining influences in the model, women still tend to exhibit lower levels of mathematics achievement. In contrast, the direct ability and SES effects of Table 1 are attenuated in the structural model, the latter appreciably so. In both instances curriculum enrollment is identified as the major mechanism for mediating these background influences.

Indeed, curriculum enrollment itself has the largest direct effect on math achievement, even slightly exceeding that of ability. Such results suggest the extent to which standardized testing instruments are curriculum based[15] (or, put somewhat differently, the extent to which curriculum content is designed to develop selected skills), although they also partially reflect the differential distribution of able students among curricula. The total indirect effect of ability through curriculum sorting would be .105, only a minor portion of the overall curriculum influence. Finally, there appears to be a modest achievement advantage accruing to youth who associate with high goal-oriented peers even independent of these other influences. Whether this effect implies a salutary consequence of peer interaction itself or the fact that youth involved in such social networks possess qualities

pertinent to achievement that are not otherwise tapped in the model cannot be resolved with these data.

The results for class rank are quite similar to those just discussed for math achievement, with but two exceptions. In this instance the peer plans coefficient is trivial and the explanatory power of the model is substantially lower (the coefficient of determination for rank is less than half that for math achievement, at .211 and .506 respectively). Substantial direct ability, sex, and curriculum coefficients are again obtained.[16] Although the last of these still subsumes some indirect background influences, the unique curriculum influence is nevertheless appreciable (about .130).

The fact that college preparatory youth are more likely to achieve high class standing even net of the dependency of grades on ability implies, minimally, that grades in non-college curricula must be skewed low relative to the distribution in college preparatory tracks even after adjusting for differences in student ability between tracks. The reasons for this certainly merit further attention. Assuming that ability has indeed been adequately controlled in our analysis and that these differences are not a function of unmeasured differences in, say, motivation, such inequalities in the distribution of scarce resources (i.e., high grades) may be founded in important institutional values, in this case the ideal of academic scholarship, which deny achievement opportunities to non-college-bound youth. Such speculation assumes that the educational pursuits of non-college preparatory tracks are for some reason defined as peripheral to the schooling mission and that the mechanisms for allocating rewards are tempered, at least in part, by such value orientations.

Certainly "social structured inequality" need not be limited to the commonly considered currencies of social exchange. Whether or not college-bound youth can be thought to constitute a "privileged class" in the social structure of the secondary school, and the implications of such differentiation should it maintain, certainly deserve further consideration.

To this point we have examined the structure of relations among school process variables and their responsiveness to various background factors. These patterns of influence have been found to be complex indeed. Academic ability, status origins, and sex each had marked consequences for academic performance, and, with the exception of sex, for school streaming and various characteristics of peer associates. Moreover, the school process variables were themselves found to operate upon one another, with curriculum enrollment having particularly far reaching consequences, both for networks of association and academic achievements. We may now consider the subjective school outcomes in the context of the full school process model.

We have already noted the structural model's appreciably great explanatory power regarding subjective outcomes in comparison with the reduced form equations. This indicates some unique importance for school process variables in the determination of subjective outcomes. Moreover, the direct background effects in Table 2 are generally much smaller than those of Table 1, implying that the school process mechanisms also serve as mediators of background influence. These school process effects are detailed in the last four columns of Table 2.

Intellectualism remains the least adequately explained of the subjective outcomes, with a coefficient of determination of .174 in the structural model. Nevertheless, it is among the most responsive to school process influences, at least in terms of number, if not magnitude, of effects. The coefficients for curriculum enrollment, friends' educational plans, class rank, and mathematics achievement all modestly exceed our criterion (.100) for imputing substantive importance. At the same time, the direct effects of ability and status origins fall below this standard, being considerably reduced from their values in Table 1. Thus, the impact of these factors is largely felt through their consequence for various school process mechanisms, which are the more proximate determinants of intellectualism. The various routes by which these background influences are exerted have been outlined in the previous discussion. Sex has the strongest direct effect upon intellectualism, with women still scoring somewhat higher than men even net of the other factors in the model. The remaining "significant" coefficients all range between .100 and .151.

The distribution of effects for academic self-conceptions is considerably different from the pattern just discussed. Instead of a sizeable number of modest influences, only two significant direct effects are identified, and each of these is appreciable. Coefficients of .300 and .242 are obtained for class rank and standardized mathematics achievement, respectively. Thus, the immediate determinants of self-conceptions of academic competence, insofar as they are tapped in this analysis, are exclusively indicators of academic performance, with relative being somewhat

more consequential than absolute achievement. Of course, to the extent that other factors in the model affect performance scores, they are indirectly implicated in the determination of self-conceptions. Interestingly, once achievement is taken into account, the direct consequences of measured ability for self-conceptions, and for the other subjective outcomes in the analysis as well, are negligible.

The influences upon school satisfaction are reasonably similar to those obtained for intellectualism, with the exception of the non-significance of mathematics achievement in this instance. Again, sex has the largest direct effect, with women expressing somewhat higher levels of satisfaction. The remaining "notable" effects are of roughly comparable magnitude, indicating some degree of independent importance for curriculum enrollment, friends' educational plans, and class rank. Each of these coefficients is somewhat larger than its counterpart in the equation for intellectual orientation. Thus, in terms of standard deviation units of change, satisfaction with school appears to be somewhat more responsive to "school process" influences than is the development of intellectual orientation.

The last subjective outcome in the model is educational plans. It is both the most adequately accounted for of the four, with an R^2 of .496, and responsive to the largest number of direct influences, with fully six of the ten factors under consideration (not counting the separate status items) having notable effects. The largest of these is accorded to curriculum enrollment, with friends' plans, mathematics achievement, and status origins having secondary, and reasonably similar, influences. Finally, the class rank and sex coefficients both modestly exceed our

.100 criterion (at .101 and -.137, respectively). As before, to the extent that variables antecedant in the model affect factors directly influencing educational plans, these too are indirectly implicated in the determination of goals.

Thus, educational plans are responsive to a wide range of influences. High math achievement, high class rank, associating with college-oriented peers, being in a college-bound track, having high status origins, and being male all contribute directly and independently to higher levels of educational expectations. It might be noted that the plans variable is the only one of the four subjective outcomes for which the standardized achievement effect exceeds that of class rank. It appears, then, that relative performance is of greatest consequence in what might be termed areas of "interest" and "attitude", while for more "tangible" decisions (i.e., goal-setting), evidence of absolute competence is most salient. This conjecture would imply that the relative importance of rank and achievement for, say, educational <u>plans</u> and <u>aspirations</u> should be reversed. Unfortunately, we do not have available the data necessary to test this proposition.

The direct effects of number of siblings, academic ability, friends' SES and friends' ability on educational goals, and indeed, for each of the other subjective outcomes as well, are negligible. This is not to suggest that such factors are entirely inconsequential, however. Friends' status and ability have modest indirect influence through their importance for friends' goals, while ability exerts its effects through mechanisms such as curriculum sorting and academic achievement. Nevertheless, net of their effects through other factors under consideration, the <u>direct</u>

consequences of respondent ability and peer background variables for subjective outcomes are uniformly insignificant.

These four subjective outcomes, then, have been found to be responsive to diverse school process influences, including peer relations, relative and absolute academic achievement, and the social and structural differentiation reflected in curriculum tracking. These school-related mechanisms contribute to subjective outcomes both uniquely and as mediators of varied background influences, particularly those of academic ability and status origins. Only sex differences were largely independent of such intervening mechanisms. Our analysis has portrayed a rather complex interplay between background and school process variables in the determination of subjective orientations to school and schooling. While background influences are indeed of considerable consequence for such outcomes, much of their importance is mediated through more proximate factors associated with the social organization of schooling. Such results attest to the informative value of considering simultaneously, within the context of an integrative theoretical framework, the broad range of familial, personal, and school process variables that combine to affect schooling outcomes.

To this point we have been assessing the adequacy of our model in explaining subjective outcomes considered singly. Another issue of interest is the model's utility in accounting for the common content, or underlying dimensional structure, of such outcomes. For the bivariate relationships among subjective orientations, this can be evaluated by comparing their residual correlations (i.e., the subjective outcome interitem correlations partialled on the entire set of predictors; see Duncan, 1966: 10) with the observed zero-order correlations. These data are presented in Table 3.

Table 3 About Here

Generally the residual correlations are about fifty-percent of their corresponding zero-order magnitudes. The smallest reduction, only about 34 percent, is obtained for the educational plans-intellectualism relationship, while the largest, some 69 percent, occurs for the plans-self-conception linkage. While these reductions are clearly not uniform, they are generally substantial. In large measure, then, the observed correlations among subjective outcomes result from their mutual dependence upon common causal influences.

While these pairwise comparisons have some suggestive value, a more informative strategy would attend to the dimensional structure implied by the overall covariance pattern among outcomes. Since our assumptions regarding causal priority among school process and background variables are incidental to our present concern, the statistical model of canonical correlation constitutes a useful tool for evaluating both the dimensional structure among subjective outcomes and the adequacy of the predictors in accounting for whatever dimensions are obtained.

The canonical analysis generates unmeasured variables (the canonical variates) as weighted linear functions of measured variables in each of two sets (in our application, the "set" of predictors and the "set" of outcomes), such that the correlation between pairs of variates is at a maximum. As many orthogonal pairs of variates may be extracted as there are measured variables in the smaller of the two sets. The variates are generated as weighted functions of measured variables in a given set. These weights, the canonical coefficients, are analogous to standardized regression weights. They reflect the direct contribution of each

measured variable to its respective variate. In contrast to factor analysis, the canonical weights are selected so as to maximize the linear covariance between domains, rather than variance within domains (Anderson, 1958; Cooley and Lohnes, 1971).

The results for the first two sets of canonical variates are reported in Table 4. The third and fourth extracted correlations are not presented. Though statistically significant at conventional levels according to the appropriate chi-square test, they are clearly of minor import, with respective values of .262 and .100.

Table 4 About Here

The first and second canonical correlations are, in order, .740 and .458. Squaring each of these provides estimates of the portion of variance shared by the respective pairs of unmeasured variates. These are .548 and .209. Thus, almost fifty-five percent of the variance in the first pair of variates is mutual. Of course, this value, though substantial, is not in itself particularly informative since we have yet to assess what portion of the total variance in the set of subjective outcomes is extracted by the first variate. If it accounts for but a minor portion of this variance, then, regardless of the size of the canonical correlation, the set of predictors (i.e., school process and background variables) will not be of much value in explaining the covariance structure among outcomes. In fact, the first canonical variate accounts for some 43.2 percent of the total variance in subjective outcomes, and the second variate extracts an additional 21.8 percent (see Cooley and Lohnes, 1971: 170 for the computational procedures

employed here). Thus, the first two variates account for about sixty-five percent of the total variance in subjective outcomes. Combining the considerable importance of variates vis-a-vis the set of outcomes with the substantial correlations between pairs of variates (i.e., the canonical correlations), indeed implies, if we are willing to impose an assumption of causal asymmetry upon the interpretation of these results, appreciable success for the set of predictor variables in accounting for variance in outcomes through their underlying dimensions. The estimates of redundancy in the variance of the "outcome" variables given the variance in the "predictor" variate would be .236 for the first canonical correlation and .046 for the second. Again, if we are inclined to consider the "predictor" set as causally prior to the outcomes, these estimates may be interpreted as coefficients of determination, with the first predictor variate accounting for almost one-fourth of the variance in subjective outcomes.

We might now briefly consider the factor structure of the canonical variates reported in Table 4. Since our interest lies primarily with the subjective outcomes, most of our comments will be devoted to these. The canonical coefficients for the "predictor" variates are, however, also reported.

The first canonical variate has a structure not unlike that implied by our consideration of the bivariate relationships. Educational expectations loads most heavily on this factor, followed, at some distance, by academic self-conceptions. Satisfaction with school and intellectual orientation have negligible canonical weights, the latter especially so.

Of course, earlier we had noted that the expectation-image correlation was most adequately accounted for by the set of predictors while the expectation-intellectualism relationship was least adequately so. Thus, these results have been obtained again in a somewhat different guise. The largest "predictor" loadings for the first variate fall to curriculum enrollment, class rank, math achievement, and friends' plans.[17] Since, with the exception of plans, these involve a substantial performance-competence component, we would probably not err too much in labeling the first outcome variate a "perceived competence" dimension.

The loadings for the second outcome variate are not readily interpretable in isolation from the corresponding predictor weights. Each outcome has an appreciable loading, with that for educational plans being the largest, but of negative sign. Next in magnitude is the satisfaction loading, followed by reasonably similar, moderate weights for the self-conception and intellectualism scales.

It is not immediately apparent what dimension of subjective orientation would account for such a pattern of loadings, consisting as it does of a substantial negative plans weight and positive coefficients for each of the other subjective outcomes. Recall, however, that the dimensional structure obtained through a canonical analysis is constrained by the variables in the second set. Indeed, inspection of these loadings does help us to construct a reasonable interpretation of the outcome pattern. Only two predictor variables contribute appreciably to the second canonical variate. These are sex, which has by far the strongest loading, and class rank. These "outcome" loadings, then, correspond in import, if not in magnitude, to the pattern of sex effects obtained in both the structural

and reduced form models. It will be recalled that despite their higher intellectualism, self-esteem, and school satisfaction scores, women still tended to express lower levels of educational plans. Thus, the second "subjective" canonical variate seems to reflect, in large measure, a sex-typed orientation to school and schooling. While subsequent inquiry might reveal these sex differences to stand as surrogates for some more fundamental factors that are unmeasured in this analysis, we are nevertheless unable to move beyond this level of interpretation with the data at hand.

In sum, then, the canonical analysis reveals two major dimensions of subjective orientation in relation to the set of predictors under consideration. These appear to involve a "performance-competence" dimension and a "sex-typed" orientation. The former was found to be, by far, the more consequential of the two. Finally, our predictors were reasonably successful in accounting for the total variance in subjective outcomes through these dimensions. The 28.2 percent explained variance in outcomes accounted for through the first two pairs of canonical variates practically exhausts the total variance explained by regressing each outcome separately upon the entire set of predictors (about 29.6 percent). Of course the separate regressions and the full canonical analysis will account for the same total outcome variance. Thus, we can achieve some degree of parsimony, without substantial loss of information, by attending only to the two major dimensions of subjective orientation that underly the four outcome variables.

SUMMARY AND CONCLUSIONS

In the introductory section of this paper we emphasized the necessary tentativeness of our inquiry. In order to pursue our substantive interest in subjective school outcomes, we were obliged to make somewhat arbitrary assumptions regarding causal priorities among other school process variables. While such simplifying assumptions facilitate analysis, they also limit its definitiveness. Though we have no reservations regarding the effects specified in our model, it is entirely possible, indeed likely, that some elements of mutual influence have been slighted. Thus, our results must be considered provisional until borne out (or revised) by data better suited to attend to such complexities. With this caveat in mind, we may review the highlights of our analysis.

Our primary interest involved the responsiveness of school-related subjective orientations to selected background and "schooling" variables commonly assumed to impinge upon them. To this end, we developed and evaluated a multivariate school process model thought to portray, with reasonable accuracy, the complex mechanisms by which these variables combine to affect subjective school outcomes. The internal structure of the model also suggested some of the ways in which school process variables operate upon one another.

We began by considering the sex, academic ability, and status origin influences upon each of the school process variables and subjective outcomes in the model.

These background factors were found to have wide-ranging consequences. With regard to school process mechanisms, academic ability was,

not surprisingly, most consequential for performance (both math achievement and class rank) and curriculum sorting. The composite status effects were appreciable for each of the school process variables, being most pronounced for the various peers characteristics and least so for class standing. The only school process variables for which sex differences were obtained were the two performance measures, with girls evidencing lower levels of mathematics achievement but somewhat higher class rank. Sex, then, did not enter into curriculum sorting, nor was it particularly relevant to the aspects of peer group formation examined here. Finally, a number of modest negative effects were obtained for family size.

With but a few exceptions, each of the background factors was of some consequence for each of the subjective outcomes. Status origins was the most important of these for education plans, sex for satisfaction with school (with girls scoring somewhat higher than boys), academic ability for self-conceptions of competence, and both sex and status origins were of about equal importance for the intellectualism scale. In view of such complexity, conclusions regarding the relative importance of background factors for subjective orientations toward school and schooling must be made with reference to particular outcomes.

Of course, recognizing substantial "linkages" does not in itself provide for their interpretation. Why, for example, are status origins so important for educational plans, exceeding even measured ability in this regard? Indeed, why should status background, net of ability differences, be of consequence for any of these subjective orientations? Moreover,

why is academic ability so inconsequential for intellectualism, and what social processes account for the seemingly anomalous finding that girls express lower levels of educational goals despite their advantages over boys in each of the other areas of subjective orientation to school and schooling?

While the full school process model has provided at least partial answers to some of these provocative questions, others, particularly those involving sex differences, remain practically unscathed by our efforts at quantitative interpretation. It may be that further attempts to explicate these processes should consider, in greater detail than we have been able, familial socialization practices and additional institutional mechanisms and interpersonal processes that impinge upon student careers. Such "institutional mechanisms" might include the role of counselling and testing programs, the availability of and access to various resources and facilities, the degree of rigidity or flexibility in the educational program, and the extent to which latitude, when it is available, is taken advantage of by different kinds of students. In terms of interpersonal processes, we are almost completely ignorant of both the ways in which extra-school relationships affect schooling behavior, and, with the exception of the suggestive "adolescent society" literature, of the implications of extra-curricular involvements and the social networks they engender for academic outcomes.

These observations are not meant to suggest that our analysis has been unenlightening with regard to the questions at hand. While the sex differences of the reduced form model were largely independent of school process mechanisms, this was not the case for the status and ability

effects. Moreover, the school process variables themselves contributed substantially to the explanation of subjective orientations.

Status origins and ability were found, in large measure, to affect outcomes, not directly, but through their relevance for other schooling variables, which themselves had direct consequences for subjective orientations. Indeed, with these mediating mechanisms included in the analysis, only one of the direct status and ability coefficients for subjective outcomes ("SES" on educational plans) was sufficiently large to warrant note. Of course, the reasons for even this single, residual direct effect, in view of its substantive importance, merit further consideration.

How do these background variables indirectly affect subjective outcomes, then? In some respects their paths of indirect influence are reasonably similar. Both ability and status origins, for example, had an appreciable effect on curriculum enrollment, which itself had important consequences throughout the model. Ability also had a major direct impact on, and hence an indirect impact through, both measures of academic performance; the status effects on performance, however, were largely indirect, being mediated through the consequences of curriculum enrollment and peer relations for performance. Finally, status origins were also critically important for entry into peer social networks, and characteristics of these, in turn, directly affected a range of schooling outcomes. Thus, attending to the structure of relations among background and school process variables has resulted in a far richer portrayal of the actual mechanisms by which the former affect subjective orientations than could be accomplished otherwise.

Of course, in addition to identifying their roles as mediators of background influence, we have also noted some important "unique" consequences

for school process variables. Curriculum enrollment was particularly important in this regard, having a notable impact on each of the subsequent variables in the model except self-conceptions of competence. This suggests the importance of social and structural differentiation in the social organization of schooling. Subsequent inquiries should attend to the actual locus of such curriculum effects and to their ramifications. The curriculum-performance linkages may be of particular interest in view of the latter's centrality to the schooling enterprise.

Our consideration of "peer influences" has helped clarify some of their dynamics. While friends are acquired, at least in part, on the basis of either status or ability homophily (with the first being the more important of the two), such peer background characteristics were consequential for subsequent outcomes almost exclusively by virtue of their implications for peer goal orientations. Thus, net of peer plans, the direct effects of peer ability and SES were uniformly negligible. It seems, then, that at least insofar as educationally relevant outcomes are concerned, the value of acquiring either high ability or high status friends is almost entirely a function of the higher goals (and perhaps other academic interests) that these youth are likely to articulate.

Finally, we considered two measures of academic performance, mathematics achievement and class rank. We have already noted the importance of curriculum enrollment for such performance scores. The mechanisms by which these linkages are maintained merit further study. Moreover, the relatively low proportions of explained variance for the performance variables, particularly for rank, indicate that to a considerable extent grades are allocated independently of the mechanisms tapped in this inquiry.

Further elucidation of this issue might require study of teacher, rather than student, performance.

We also demonstrated that the consequences of these two performance measures were neither similar to one another, nor uniform across subjective outcomes. Math achievement exceeded rank in importance for educational plans, while rank was of at least modest consequence for each of the three other outcomes, having its strongest effect upon self-conceptions of competence. It appears important, then, to attend to the multiple forms of academic performance and achievement and their social consequences in studies of the schooling process. Premature adoption of a single indicator as capturing the "essence" of academic performance will likely mask much of the richness and complexity of these processes.

We concluded our inquiry by evaluating the adequacy of the set of predictor variables (i.e., background and school process variables) in accounting for the common content of subjective outcomes. Comparing the residual correlations among subjective variables with their zero-order relations revealed reductions generally on the order of fifty-percent, although these varied from a high of almost seventy percent to a low of thirty-four. Thus, on the average, about half the correlations among subjective outcomes were attributable to their common dependency upon background and school process variables.

Finally, a canonical correlation analysis was evaluated to more explicitly consider the underlying dimensional structure of the subjective outcome covariance extracted by the set of predictors. The two notable "outcome" canonical variates together accounted for about sixty-five per-

cent of the total variance in subjective orientations, and the first two canonical correlations practically exhausted the variance in outcomes accounted for by the separate regression equations. Thus, a certain parsimony can be achieved, without appreciable loss of information, by attending to the two-major underlying dimensions of subjective orientation, rather than the separate indicators. Considering both predictor and outcome loadings, the first canonical correlation appeared to involve a "perceived competence" dimension and the second a "sex-typed" orientation to school and schooling. Further inquiry might reveal some more fundamental basis of the latter, but we were unable to pursue this matter further with the available data.

FOOTNOTES

1. The little research to have addressed such matters suggests only modest importance for subjective variables for "tangible" schooling and stratification outcomes. See, for example, Alexander and Eckland, 1973; Elder, 1968; Featherman, 1972; and Sewell and Hauser, 1972.

2. Of course, numerous areas of standardized achievement have been extensively studied in the educational psychology literature. For an informative consideration of grades and achievement within the kind of multivariate modeling framework employed here, see Hauser, 1971.

3. Elsewhere, Alexander and Eckland (1974a) have suggested that the distinction between absolute and relative performance might inform the study of school contextual effects We explored their conjecture by incorporating measures of student body aptitude and student SES into our school process model. While our results provided some support for their propositions, the effects obtained were uniformly small and not entirely as anticipated. Certainly, the consequences of incorporating measures of both relative and absolute performance into the school effects model were neither sufficiently important nor illuminating to warrant making them a major substantive focus on this project.

4. For example, curriculum streaming decisions typically are made before the senior year, while the "outcome" variables refer to current subjective states. The ordering of performance and peer variables is somewhat more problematic.

5. These two instruments were developed for the Project Talent studies.

6. Two of the schools, located in the same city of the South Atlantic region, were new institutions which contained no seniors. Data were available for <u>all</u> variables on 1,731 of the 2,576 male seniors (67%) and 1,968 of the 2,612 female seniors (75%). An extensive series of checks revealed the biases attending this attrition to generally be negligible. For example, the average differences in variable means and standard deviations for the total sample and the "full data" sample employed in the analysis were only .316 and .218 units respectively; the average differences between "pairwise present" and "full data" interitem correlations for 135 comparisons was .011 (ranging from .052 to .000); and, finally, the average correlation of missing data dummy variables (for those variables with at least one percent nonresponse) with valid responses on other variables was but .046 over 206 comparisons (ranging from .158 to .002).

7. While our primary interest in this variable is as an indicator of family status, we recognize that it also taps a number of additional familial characteristics, in particular the "intellectual atmosphere" of the home--see McDill and Rigsby, 1973:58-61.

8. Shaycoft (1967) demonstrates the stability of AR scores through the high school years and dicusses the appropriateness of employing them as measures of mental ability.

9. Students who responded "no,never" to the second question were instructed not to answer this one.

10. The sheaf index construction strategy does not test for unidimensionality among indicators. Thus, the pertinence of an indicator for a construct is defined a priori, rather than established empirically.

11. These results are consistent with our earlier comment (see Note 7) regarding the "intellectual atmosphere" loading of the number of books variable.

12. The Project Talent researchers (Flanagan, et.al., 1964:3-2) who developed the math test attributed the sex difference in achievement to the boys' greater interest in mathematics.

13. Computation of indirect SES effects with the data presented would be only approximate. Actually, there are as many "SES" variables constructed as there are dependent variables in the model, and such indirect effects would have to be computed through the correlations among status indicators--see Alexander and Eckland, 1973: for a more detailed discussion of this matter.

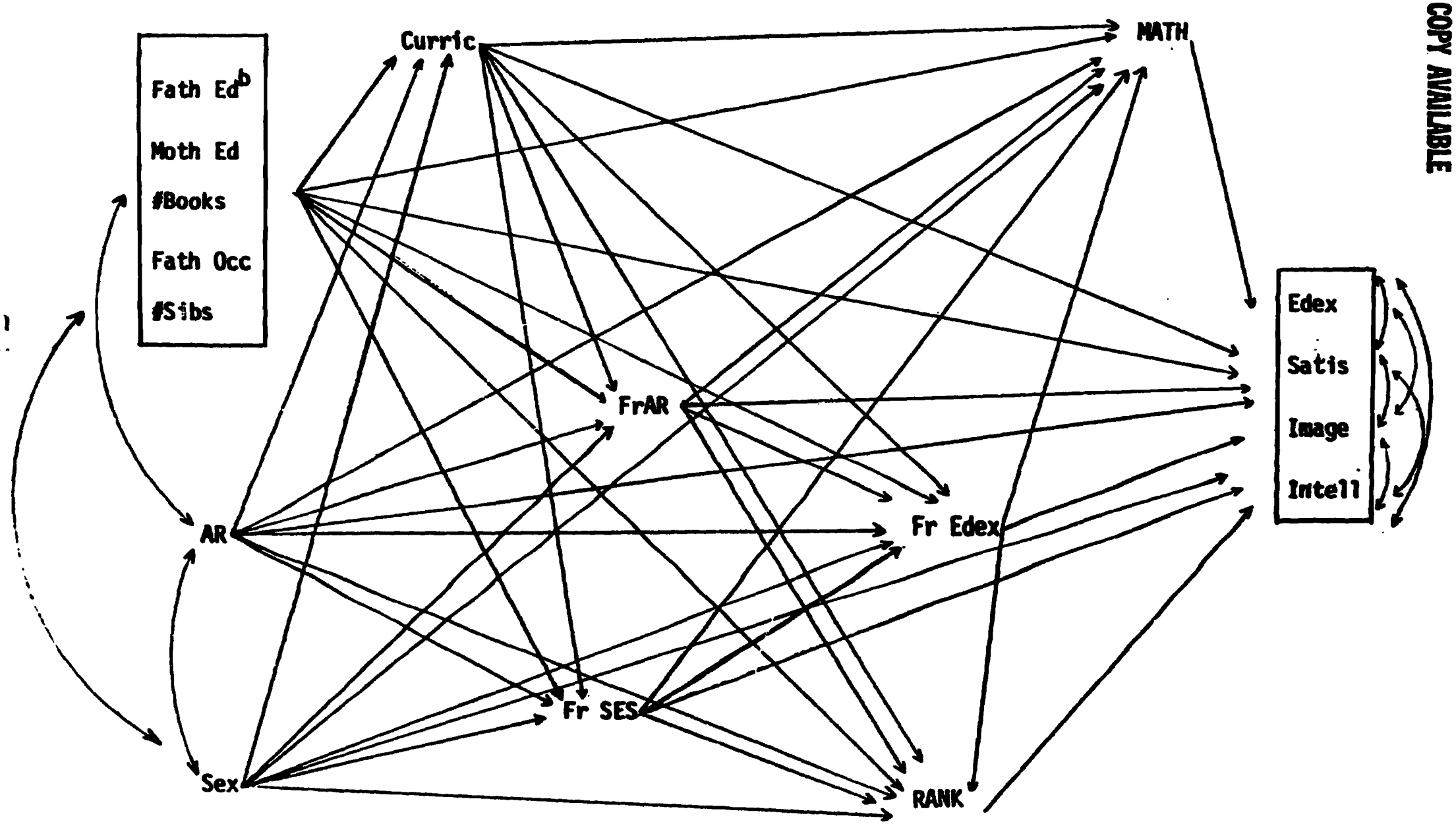
14. See Duncan, 1966 or Land, 1969 for the procedures for computing indirect effects in path analysis.

15. McDill and Rigsby (1973: 63-64) provide evidence supporting this position.

16. It might be noted that the sex coefficient is actually somewhat larger in this instance than its reduced form counterpart. This implies some "positive" consequences of being female earlier in the model whose effects are offset by the increase in direct effects.

17. One must be cautious in interpreting loadings such as these, since they will be affected by the redundancy among indicators. The separate status loadings, for example, might be "deceptively" low.

Figure 1: The Twenty School Model of Subjective School Outcomes[a]



a) See the note to Table 1 for a listing of variable abbreviations

b) For ease of presentation, the status indicators and subjective outcomes have been represented as "blocks" in the diagram; however, in the analysis separate indicators and outcomes will be employed.

Table 1: Standardized Reduced Form Coefficients for the Twenty School Model of Subjective School Outcomes (N = 3699)

	Curric	Fr. AR	Fr. SES	Fr. Edex	Math	Rank	Intell	Image	Satis	Edex
Fath Ed[a]	.066	.050	.128	.096	.063	.051	.014	.042	.024	.102
Moth Ed	.096	.099	.143	.133	.086	.042	.028	.032	.084	.109
Books	.109	.042	.097	.078	.050	-.009	.126	.064	.062	.144
Fath Occ	.088	.098	.160	.138	.110	.038	.050	.063	-.005	.112
"SES"	(.279)	(.229)	(.416)	(.351)	(.245)	(.106)	(.177)	(.158)	(.136)	(.363)
#Sibs	-.113	-.052	-.046	-.120	-.038	-.055	-.054	-.103	-.048	-.108
Sex	-.050	.058	.052	-.060	-.203	.183	.175	.088	.253	-.180
AR	.231	.170	.090	.173	.428	.287	.091	.220	.142	.206
R^2	.184	.106	.204	.207	.355	.135	.077	.107	.107	.266

a) The following variable abbreviations are employed in this and all other tables and figures: "Fath Ed," father's education; "Moth Ed," mother's education; "Books," number of books in respondent's family household; "Fath Occ," father's occupation; "SES," th composite sheaf coefficient; "#Sibs," number of siblings; "Sex," respondent's sex; "AR," abstract reasoning scores; "Curric," curriculum enrollment, "Fr. AR," friends' average abstract reasoning scores; "Fr. SES," percent of friends whose father's had at least some college education; "Fr. Edex," percent of friends with college plans; "Math, mathematics achievement scores; "Rank," senior year class rank; "Intell," intellectual orientation; "Image," self-conceptions of academic competence; "Satis," satisfaction with school: "Edex," educational expectations.

Table 2: Standardized Structural Coefficients for the Twenty School Model of Subjective School Outcomes (N = 3699)

	Curric	Fr. AR	Fr. SES	Fr. Edex	Math	Rank	Intell	Image	Satis	Edex
Fath Ed	.066	.040	.120	.038	.020	.024	-.017	.009	-.011	.047
Moth Ed	.096	.085	.131	.053	.024	.001	-.015	-.006	.037	.036
Books	.109	.026	.084	.017	-.004	-.044	.102	.050	.033	.090
Fath Occ	.088	.085	.149	.057	.050	-.001	.006	.020	-.050	.035
"SES"	(.279)	(.189)	(.383)	(.133)	(.078)	(.040)	(.094)	(.064)	(.055)	(.164)
#Sibs	-.113	-.035	-.032	-.069	.021	-.014	-.014	-.069	.004	-.040
Sex	-.050	.065	.059	-.072	-.183	.196	.180	.088	.241	-.137
AR	.231	.136	.062	.055	.313	.204	-.050	.015	.020	.000
Curric		.148	.121	.263	.338	.239	.102	.048	.160	.274
Fr.AR				.213	.061	.077	.064	.005	.038	.007
Fr.SES				.233	.035	.012	-.030	-.030	-.038	.008
Fr.Edex					.135	.088	.117	.032	.198	.193
Math							.107	.242	-.003	.185
Rank							.151	.300	.171	.101
R^2	.184	.124	.216	.390	.506	.211	.174	.288	.226	.496

Table 3: "Residual" and Observed Interitem Correlations Among Subjective School Outcomes[a]

	Intell	Image	Satis	Edex
Intell		.126	.147	.229
Image	.316		.111	.112
Satis	.305	.283		.126
Edex	.357	.359	.284	

a) "Residual" correlations appear in the upper-right triangle of the matrix. The effects of all predictor variables have been partialled from these relationships.

Table 4: Canonical Correlation Analysis of the "Predictor" and "Subjective Outcome" Variables of the Twenty School Model

First Canonical Correlation: .740				Second Canonical Correlation: .458			
	"Predictor" Loadings		"Outcome" Loadings		"Predictor" Loadings		"Outcome" Loadings
Fath Ed	.048	Intell	.055	Fath Ed	-.106	Intell	.443
Moth Ed	.041	Image	.309	Moth Ed	-.030	Image	.362
Books	.127	Satis	.165	Books	.026	Satis	.617
Fath Occ	.033	Edex	.750	Fath Occ	-.107	Edex	-.796
#Sibs	-.070			#Sibs	.007		
Sex	-.035			Sex	.806		
AR	.007			AR	-.008		
Curric	.341			Curric	-.124		
Fr. AR	.022			Fr. AR	.105		
Fr. SES	-.016			Fr. SES	-.118		
Fr. Edex	.262			Fr. Edex	.070		
Rank	.277			Rank	.439		
Math	.296			Math	-.031		

Table A: Twenty School Reduced Form Model of Subjective School Outcomes

For Boys (N = 1731)

	Curric	Fr. AR	Fr. SES	Fr. Edex	Rank	Math	Edex	Satis	Image	Intell
Fath Ed	.055	.006	.101	.058	.052	.040	.103	.041	.039	.053
Moth Ed	.076	.081	.166	.137	.049	.070	.096	.095	.034	.053
Books	.099	.052	.134	.061	.007	.044	.141	.105	.074	.125
Fath Occ	.084	.107	.126	.114	.034	.115	.105	-.010	.085	.047
# Sibs	-.121	-.095	-.038	-.145	-.047	-.062	-.118	-.032	-.086	-.099
AR	.211	.192	.092	.165	.250	.438	.202	.118	.230	.107
R^2	.144	.104	.193	.159	.092	.289	.207	.059	.115	.079

For Girls (N = 1968)

	Curric	Fr. AR	Fr. SES	Fr. Edex	Rank	Math	Edex	Satis	Image	Intell
Fath Ed	.077	.094	.154	.133	.052	.093	.107	.008	.046	-.023
Moth Ed	.112	.113	.122	.126	.038	.104	.130	.081	.033	.012
Books	.118	.035	.066	.092	-.029	.059	.156	.029	.056	.134
Fath Occ	.093	.085	.187	.156	.045	.108	.122	.002	.039	.049
# Sibs	-.106	-.015	-.052	-.101	-.070	-.017	-.103	-.065	-.118	-.014
AR	.243	.148	.089	.176	.349	.439	.219	.170	.213	.078
R^2	.211	.112	.215	.243	.155	.340	.270	.053	.096	.036

Table 8: Twenty School Structural Model of Subjective School Outcomes, For Boys

	Curric	Fr. AR	Fr. SES	Fr. Edex	Rank	Math	Edex	Satis	Image	Intell
Fath Ed	.055	.001	.097	.026	.032	.005	.064	.015	.010	.028
Moth Ed	.076	.074	.160	.072	.010	.006	.030	.052	-.008	.006
Books	.099	.043	.127	.002	-.027	-.012	.094	.082	.052	.094
Fath Occ	.084	.099	.121	.048	-.007	.052	.032	-.049	.035	-.003
#Sibs	-.121	-.084	-.030	-.086	.007	.016	-.042	.020	-.043	-.048
AR	.211	.173	.078	.052	.165	.314	-.009	.006	.027	-.033
Curric		.089	.068	.251	.254	.358	.238	.122	.058	.117
Friend AR				.226	.068	.081	.011	.001	.002	.098
Friend SES				.169	-.014	.036	.003	-.020	.004	.011
Friend Edex					.121	.176	.187	.194	.048	.108
Rank							.105	.174	.251	.120
Math							.231	.028	.272	.110
R^2	.144	.111	.197	.307	.184	.478	.454	.173	.306	.187

Table C: Twenty School Structural Model of Subjective School Outcomes, For Girls

	Curric	Fr. AR	Fr. SES	Fr. Edex	Rank	Math	Edex	Satis	Image	Int
Fath Ed	.076	.079	.141	.050	.017	.042	.034	-.040	.012	-.0
Moth Ed	.112	.091	.104	.039	-.007	.042	.048	.028	-.001	-.0
Books	.118	.012	.046	.035	-.065	.005	.091	-.006	.051	.1
Fath Occ	.093	.067	.172	.060	.006	.048	.037	-.050	.005	.0
#Sibs	-.106	.006	-.035	-.055	-.037	.032	-.038	-.012	-.086	.0
AR	.243	.101	.048	.056	.266	.327	.014	.025	-.004	-.0
Curric		.195	.166	.266	.236	.342	.330	.193	.042	.0
Friend AR				.197	.101	.046	.003	.066	.003	.0
Friend SES				.286	.000	.046	.018	-.066	-.055	-.0
Friend Edex					.056	.100	.207	.221	.028	.1
Rank							.081	.185	.360	.1
Math							.133	.020	.184	.0
R^2	.211	.142	.237	.454	.228	.478	.510	.200	.282	.1

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